

We claim:

1. A continuous method of making a combinatorial library of materials comprising:

5 providing at least one plug flow reactor,
introducing one or more components into the plug flow reactor, and
introducing or changing over time at least one variable affecting the one or more
components to produce a combinatorial library of materials.

10 2. The method of claim 1 further comprising evaluating the materials of the
library.

3. The method of claim 1 wherein the resulting materials comprise at least one
of polymeric materials, small-molecule materials, blended materials comprising at least
15 one polymeric component, biological materials, and biologically-active materials.

4. The method of claim 1 wherein the plug flow reactor comprises a stirred
tube reactor.

20 5. The method of claim 1 wherein the plug flow reactor comprises an
extruder.

6. The method of claim 1 wherein the plug flow reactor comprises a static
mixer.

25 7. The method of claim 1 wherein the plug flow reactor comprises a stirred
tube reactor in tandem with an extruder.

8. The method of claim 1 wherein the variable is from the group consisting of
30 concentration of starting material, type of starting material, pressure in the reactor,
temperature profile in the reactor, amount of energy supplied to a reaction zone, type of

energy supplied to a reaction zone, type of component mixing, degree of component mixing, residence time, and where and when additional components are introduced into the plug flow reactor.

5 9. The method of claim 1 wherein the changing of a variable is performed in a continuous manner.

 10. The method of claim 1 wherein the changing of a variable is performed in a stepwise manner.

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 11. The method of claim 1 wherein the variable is physical mixing of components.

 12. The method of claim 1 wherein the variable is chemical reaction of
15 components.

 13. The method of claim 12 wherein the chemical reaction is a polymerization method consisting of at least one of step-growth, chain-growth, and coordination.

20 14. The method of claim 13 wherein the coordination reaction uses a Ziegler Natta or metallocene catalyst.